LEAD AND COPPER RULE (LCR) UPDATE

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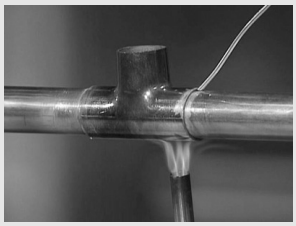
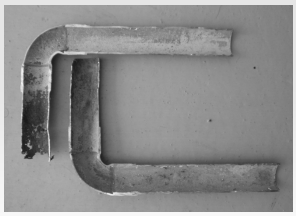
SOURCES OF LEAD AND COPPER

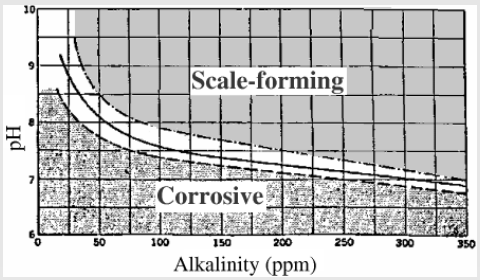
- Corrosion of household plumbing systems
  - Lead pipe
  - Copper pipe with lead solder
  - Lead service lines
- Ban of lead material
  - Lead free material still contains a percentage of lead
- Present in source water
  - Wells or surface water intakes
  - Can be mixed with multiple sources (Entry Point)





CORROSION VS. SCALE FORMING

- Corrosive water
  - Low pH
  - Soft water
  - Low alkalinity
- Scale forming
  - High pH
  - Hard water
  - High alkalinity
- Customer issues with corrosive water
  - Bitter taste
  - Stained Laundry
  - Greenish-Blue Stains around basins and drains



Baylis Curve

HEALTH EFFECTS

- Lead
  - Children are highly susceptible
  - Shorter attention span
  - Impaired mental development and IQ deficits
  - EPA set MCLG at zero
- Copper
  - Stomach and intestinal distress
  - Complications of Wilson's Disease
  - Chronic exposure can cause liver disease
  - EPA set MCLG at 1.3 mg/L

LEAD AND COPPER RULE (AMENDED)

- Frequent Revisions
  - 1991 Original published
  - 2000 Minor Revisions to the Lead and Copper Rule
  - 2007 Short – Term Lead and Copper Rule Revisions
  - ??? Long – Term Revisions Lead and Copper Rule
- Corrections and modifications in an attempt to reduce compliance issues and clarify monitoring requirements

2007 REVISIONS

- Public Education
  - Mandatory language rewritten (shortened)
  - Distribution process restructured
- Clarifications to the three year monitoring period
  - Systems must collect every three years
  - State maintains the three year schedules

COMPLIANCE

- Collect samples from customer homes connected to the distribution system
  - Targeting high risk homes
    - Tier Levels I, II, III and representative site
    - Prior to lead ban in 1988
    - Lead Service Lines
- Action Levels
  - Lead = 0.015 ppm or 15 ppb
  - Copper = 1.3 ppm
- If over 10 percent of the samples collected are greater than the respective action levels, the water system must take action to reduce the corrosiveness of the water before it reached the customer's home

SAMPLE MONITORING

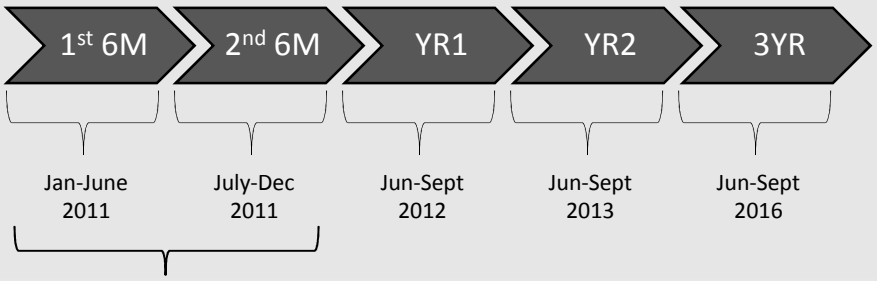
- Initial
  - 6 month schedule
    - January – June
    - July – December

Population	Sample Sites
>100,000	100
10,001 – 100,000	60
3,301 – 10,000	40
501 – 3,300	20
101 – 500	10
< 100	5

- Reduced
  - Annual (Yearly) and Triennial (Every 3 Years)
    - Warmest Months
    - June – September

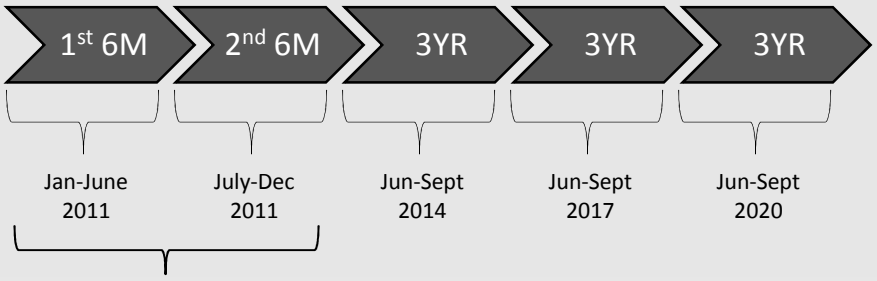
Population	Samples Sites
> 100,000	50
10,001 – 100,000	30
3,301 – 10,000	20
501 – 3,300	10
< 500	5

MONITORING TIMEFRAME



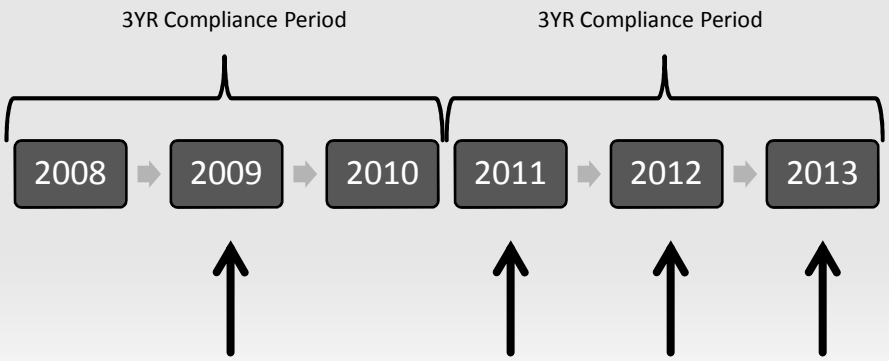
If system meets ≤ 1.3 ppm for Cu and ≤ 0.015 ppm for Pb for both routine monitoring sets

ACCELERATED TIMEFRAME



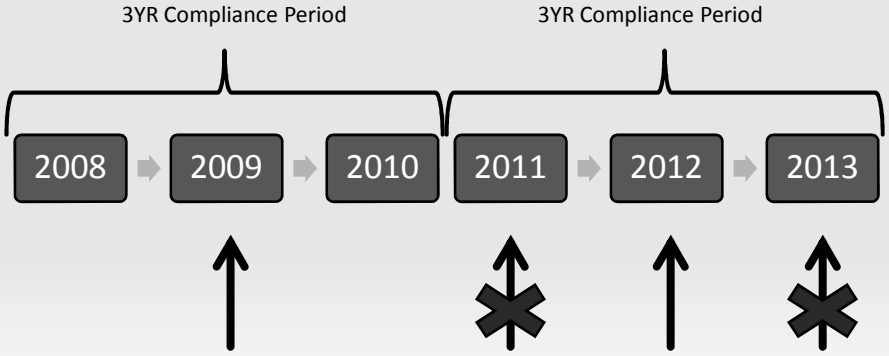
If system meets ≤ 0.65 ppm for Cu and ≤ 0.005 ppm for Pb for both routine monitoring sets

MONITORING



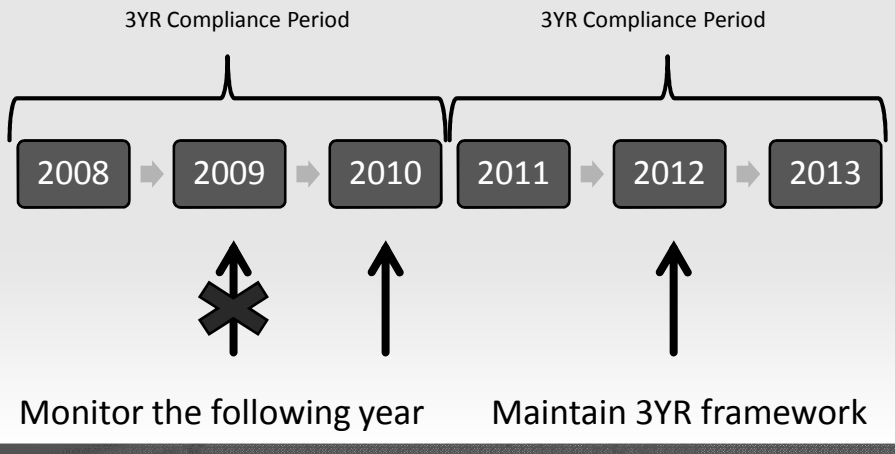
Previous rules revisions have allowed for the water system to collect anytime within the 3 year monitoring period. This is no longer acceptable.

MONITORING FRAMEWORK – 3YR



If on a reduced triennial cycle, the water system must collect samples no less than three years apart

FAILURE TO MONITOR



STANDARD PROCEDURE

- State maintains water system sample schedule
- State sends sample kit(s) w/materials
  - The systems is still required to collect the samples if a sample kit was not received
  - Call the State, and we will send another kit
- The water system is responsible for collecting samples
  - Resident or employee
  - Sample procedures must be maintained
- Water system send samples to State Lab
- State Lab preserves and analyses samples
- State sends results to the water system

SAMPLE COLLECTION

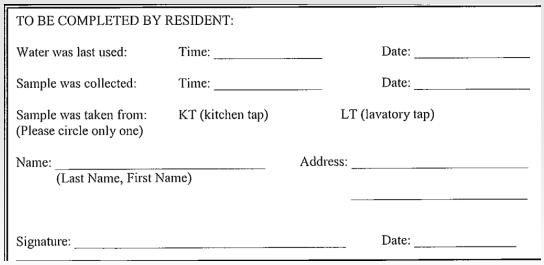
- First Draw Sample
- Frequently Used (Daily)
- Interior Source (Kitchen or Lavatory)
- Collect samples after water has rested for 6 hours
  - Morning
  - Evening

SAMPLE COLLECTION

- Samples can be collected by the water operator or by the resident
  - If collected by the resident, instructions must be given to the collector for proper sample collection
  - Samples can not be invalidated because of improper samples collection by the collector after a result has been obtained
- Information needed
  - Name of the person collecting the sample
  - Address where sample is collected (unique)
    - Apartments need individual numbers if at the same address
    - Businesses must identify sample points (*i.e.* men's lavatory)
  - Date and time samples was collected
  - Kitchen or Lavatory Sample
  - When the water was used last

CUSTOMER INSTRUCTION

- Instruction sheet for collecting samples
- Required to be given to the customers if they are collecting the samples
  - Bottom of the Instruction sheet



TO BE COMPLETED BY RESIDENT:

Water was last used: Time: _____ Date: _____

Sample was collected: Time: _____ Date: _____

Sample was taken from: KT (kitchen tap) LT (lavatory tap)
(Please circle only one)

Name: _____ Address: _____
(Last Name, First Name)

Signature: _____ Date: _____

SAMPLE LABELS

A page of sample labels will be included in the sample kit
Included with the labels is a label for the State Lab

LEAD & COPPER FIRST DRAW COLD DRINKING WATER TAP SAMPLE

***PWS ID*:** LA1234567

***SUPPLY*:** ABC WATER SYSTEM

L1234567

SAMPLE COLLECTION AND COLLECTOR INFORMATION:

9 / 10 / 09 2:30 PM Doe, John

Date (mo/day/yr) ***Time*** (24 hrs) ***R*** (Resident) ***or E*** (Employee)

TAP CODE (Circle One): **KT** (Kitchen) **LT** (Lavatory)

Street Address: 9999 Eastside Lane

FORM A – LOG SHEET

Form A – LEAD AND COPPER SAMPLE LOG SHEET

PWS ID: SYSTEM NAME:

LAB NUMBER (LAB USE ONLY)	TIER LEVEL (I, II, III)	ADDRESS	COLLECTOR	R/E	TAP	DATE	TIME

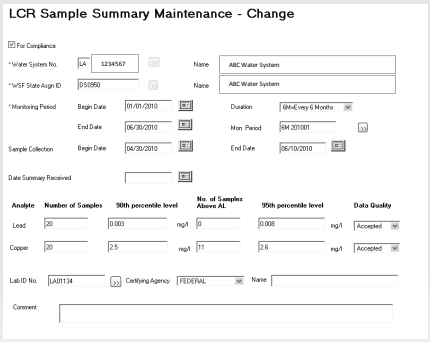
Instructions:
Tier Level – Indicate whether sample site is Tier Level I, II, or III
Collector – Last Name, First Initial of the person collecting the sample
R/E – Indicate whether a Resident (R) or Employee (E) collected the sample
Tap – Indicate whether sample was taken from kitchen (KT) or lavatory (LT)

FORM B – CHANGE OF SAMPLE SITE

- Original Site Address and New Site Address
- Approximate Distance between sites
- Original Site Tier Level and New Site Tier Level
- Reason for change
  - House is no longer occupied
  - Resident is unwilling to collect or allow the operator to collect the sample
- The new sample address will be updated in our database through the lab

LAB SUBMITTAL AND STATE DATABASE

- System sends samples to Lab
  - Samples can be sent separately
  - Must include Form A for each set sent to the Lab
  - Samples must reach the lab within 14 days (Acid preservation)
- Analysis is done State Lab and the results are placed in the a Database



DETERMINING COMPLIANCE

- 90th Percentile must be less than or equal to the action levels to remain in compliance
  - Lead = 0.015 ppm or 15 ppb
  - Copper = 1.3 ppm
- For example, if 30 samples are collected
  - 30 x 0.9 = 27
  - 27th Highest Sample for lead and copper will be your result
- All results will be included in the 90th percentile calculation

90TH PERCENTILE VALUE

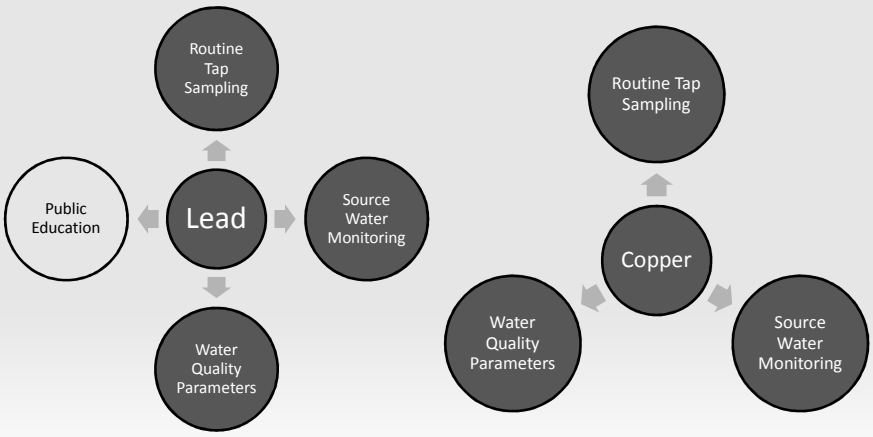
- Separate Pb and Cu – arrange results from lowest to highest
- 10 samples x 0.9 = 9th highest sample is 90th percentile
- System meets compliance criteria →

	Pb (ppm)		Cu (ppm)
1	0.002	1	0.0
2	0.002	2	0.1
3	0.003	3	0.1
4	0.004	4	0.1
5	0.005	5	0.3
6	0.008	6	0.7
7	0.009	7	1.0
8	0.009	8	1.1
9	0.014	9	1.3
10	0.043	10	1.3

IF AN EXCEEDANCE OCCURS

- An Exceedance is not a violation
- Treatment steps
  - Collect analytical samples
  - Continue customer tap samples on a 6 month basis
  - Select a treatment option or equivalent step
  - Approval by the State and installation of treatment
  - Follow-up monitoring
  - Determine optimum corrosion control
  - Continue customer tap sampling

LEAD AND COPPER



SOURCE WATER MONITORING

- Evaluate the source water and eliminate it as the cause of the high level of lead and/or copper
- Lead and Copper – Certified Lab
  - Standard Methods, 21st Edition
  - ASTM
  - EPA Method
- Add treatment if the source is identified as being contaminated

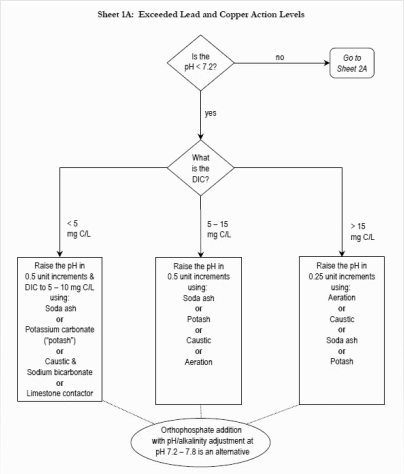
WATER QUALITY PARAMETERS (WQPS)

- 2 sets of distribution system samples
  - pH
  - Alkalinity
  - Calcium
  - Conductivity
  - Water Temperature
  - Orthophosphate*
  - Silicate*
- Used to determine appropriate treatment

*Only if currently used by the water system for treatment

TREATMENT DETERMINATION

- WQPs
  - pH 5 ≈ "Soft" Drinking Water
  - alkalinity
- Dissolved Inorganic Carbonate (DIC)
  - Derived from the pH and alkalinity
- Guidance Manual for Selecting Lead and Copper Control Strategies



LEAD TREATMENT OPTIONS

- Caustic (Sodium or Potassium Hydroxide)
- Soda Ash/Potash
- Aeration Systems
- Limestone Contactors
- Orthophosphate (0.5 ppm and 1.0 ppm
  - pH/alkalinity adjustment
- Silicates

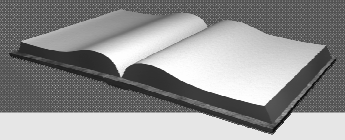
PUBLIC EDUCATION

- Required for all water systems that exceed the lead action level
  - Shortened mandatory language
  - Delivery requirements to target sensitive populations
  - Materials to all bill paying customers
  - Mandatory language included on water bill quarterly

PUBLIC EDUCATION ACTIVITIES

- Community Water
  - Serving greater than 3,300 – conduct 3 additional activities
  - Serving 3,300 or fewer – conduct 1 additional activity
- Non-transient Non-community Water
  - Materials to every person served
  - Post material in public place
- Additional Activities
  - Public Service Announcements (PSAs)
  - Paid Advertisements
  - Display information in public areas
  - E-mail to customers
  - Public Meetings
  - Delivery to every household
  - Provide materials directly to multi-family homes

RECORD KEEPING



- Lab reports shall be mailed to the water system after reviewed by the State
  - Information on next monitoring period
  - Lab report with individual results and addresses
  - Water system can distribute individual results to the sample address
- Lab results for lead and copper shall be kept for 12 years

REVIEW

- After a sample is collected from the tap, it needs to reach the lab within _14_ days.
- If 15 % of your samples exceed the 1.3 mg/L copper action level, are you out of compliance? _Yes_ 15% > 10%
- If your population increases from 2,560 people to 3,405 people, can you still collect 10 samples if you are on a reduce cycle? _No_

  20 samples will be required. New samples sites must be identified.

REVIEW (CONT'D)

- Can samples be submitted to the lab in separate shipments? _Yes_

  If you have to break up shipments to get the samples to the lab as soon as possible, do so. Include a separate log sheet with each package.

- When are you required to submit Public Education to consumers and sensitive population

  If the system exceeds the 0.015 mg/L action level, public education must be distributed. Only for a Lead action level exceedance.

THINGS TO REMEMBER

- Lab rejection
  - Lost in transit (1 liter sample)
  - Exceeded Hold Time
    - 14 day hold time
    - Acid preservation
- Minimum number of samples collected
  - 19 samples submitted out of 20 results in a monitoring and reporting violation
  - A 90th percentile value will still be calculated

- Know your schedule

Questions

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